Amendments to the Specification

Please insert the following heading before paragraph [0001] and please replace paragraph [0001] with the following amended paragraph:

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application Ser. No. 60/463,259, filed Apr. 16, 2003, <u>and U.S. Provisional Application Serial Number 60/489,629, filed July 24, 2003,</u> the teachings of which are incorporated herein by reference.

Please insert the following headings and <u>new</u> paragraphs after paragraph [0001]:

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0001.1] Not applicable

THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT

[0001.2] Not applicable

INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

[0001.3] Not applicable

BACKGROUND OF INVENTION

Please insert the following heading before paragraph [0009]:

BRIEF SUMMARY OF THE INVENTION

Please insert the following heading before paragraph [0025] :

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Please insert the following heading before paragraph [0032] :

DETAILED DESCRIPTION OF THE INVENTION

Please replace paragraph [0034] with the following amended paragraph:

[0034] FIG. 3 shows the signal waveform measured on a sample comprised of a 0.55 µm-thick film of Si02 thermally grown on a silicon wafer, with the excitation period 8.86 µm. This waveform does not contain a contribution due to the acoustic wave generated in the air because metal film 22 is absent from the sample.

Please replace paragraph [0036] with the following amended paragraph:

[0036] FIG. 4 depicts a signal waveform measured under the same conditions as the waveform depicted in FIG. 3. on a sample, comprised of a 46 A of chemical-vapor-deposited TiSiN film on 0.55 µm Si02 on a Si wafer. Thus the only difference between measurements shown in FIG. 3 and FIG. 4 is the presence of a very thin TiSiN film 22 in the latter case. One can see that the signal waveform is now modulated with slow oscillations 200. Dividing the acoustic wavelength of 8.86 µm determined by the spatial period of the excitation pattern by the period of the slow oscillations 200 25.4 ns results in a velocity of 349 m/s, i.e., the sound velocity in the air under typical conditions. Consequently, the slow oscillations 200 correspond to the component of the signal due to the acoustic wave in the air caused by the heat transfer from the TiSiN film 22 to the air above the film. Due to its low frequency, the contribution of the acoustic wave in the air to the signal can easily be distinguished from the other components of the signal (e.g. SAW component, responsible for the high frequency oscillations 100 in the waveform).

Please replace paragraph [0038] with the following amended paragraph:

[0038] Thus for films <100 A in thickness, there exists a correlation between the amplitude of the slow oscillations 200 in the signal and the film thickness. This allows the use of the amplitude of the slow oscillations 200 for film

Please replace paragraph [0039] with the following amended paragraph:

[0039] In order to find the said amplitude, the "tail" of the signal waveform is fitted to the following functional form comprised of the sum of an exponentially decaying function, decaying oscillations and a constant offset:

$$S = A\exp(-t/\tau_1) + B\exp(-t/\tau_2)\sin(\omega t + \theta) + C \qquad (1)$$

The frequency ω, phase θ and decay time τ_2 of the airwave were determined based on the data from one of the TiSiN film samples and then fixed at the determined values. Other parameters i.e. A, τ_1, B and C were varied in a multi-parameter fit, with the best fit value of B taken as the airwave amplitude. FIG. 5 illustrates the fitting procedure, with the line 201 showing the measured signal waveform and the line 202, juxtaposed with a portion of line 201, showing the best fit calculated according to equation (1).

Please replace paragraph [0041] with the following amended paragraph:

[0041] FIG. 7 depicts diameter profiles of two TiSiN films deposited on Si wafers 200 mm in diameter with 0.55 μm thermally grown Si02 . Measuring the amplitude of the slow oscillations 200 in the signal according to the procedure described above and applying an empirical calibration according to FIG. 6 obtained the data. To improve signal-to-noise, the data were averaged over 10 consecutively measured diameter scans. It should be noted that while an above measurement example utilized an empirical calibration, the method can be enhanced by using a theoretical model including the following steps:

Please replace paragraph [0048] with the following amended paragraph:

[0048] It should be noted that the described mechanism of the acoustic wave excitation in the air will be equally valid for a different gas or liquid medium in contact with the sample. Measurement of samples immersed in a liquid can have potential applications such as in-situ control of the CMP process._The invention provides many additional advantages that are evident from the description, drawings, and claims.

Please insert the following after paragraph [0049]:

CLAIMS

What is claimed is: